

Staffing and Training Recommendations for Imaging Physics in the West Midlands

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Executive Summary

- **Medical Physics services across the West Midlands are working at approximately a 10% vacancy rate across all imaging specialisms.**
 - *There is an expected growth of the Imaging Medical Physics service to address the additional imaging equipment as detailed in the Richards' Report¹. There is also additional need for growth from the implementation of Community Diagnostic Centres (CDCs) across England². As a result of this, there is a need for the Medical Physics workforce to grow in line with the service demand. Investing more into programmes such as the Scientist Training Programme (STP), apprenticeships and other training routes will help to address this growth.*
- **Based on calculations from the Institute of Physics and Engineering in Medicine (IPEM) Workforce surveys, all Medical Physics specialisms are understaffed.**
 - *Most specialisms require at least twice the number of current staffing to reach those levels published by IPEM.*
 - *Increased use of clinical technologist roles, especially for specialisms where they are currently under used, could help to address this.*
- **The installation of additional imaging equipment across the West Midlands will require additional Medical Physics support.**
 - *Medical Physics input into the design stages of these imaging facilities is essential to ensure that patients, staff, and the public always remain safe.*
- **The Midlands remains one of the only regions across England not to have a Medical Physics Practice Educator to assist with the facilitation of training.**
 - *A medical physics practice educator role has been shown to help with establishing training strategies and resources for the development of trainees within medical physics.*
 - *The role of a medical physics practice educator aims to improve the delivery of training provision for STP, apprenticeship training and other training routes.*
- **To achieve the goals laid out by the NHS Long Term Workforce Plan (30% increase in training capacity by 2031/32) immediate action must be taken to achieve this goal.**

The combination of these factors will require a restructuring and rethinking of the current workforce planning and training model. The current staffing level is not equipped to cope with both an increase in training workload and the increase in work from service expansion.

Current Situation

According to IPEM Workforce Reports²⁻⁶, Medical Physics staffing is below safe levels. To add to this, imaging departments are experiencing expansion through the establishment of Community Diagnostic Centres (CDCs). The CDC initiatives aim to tackle the waiting lists that have been increasing in size since the 2020 pandemic. In addition, the increasing complexity of treatments and therapies also require increasing involvements from the Medical Physics workforce. The impact on the Medical Physics workforce is reflected by the NHS Long Term Workforce Plan⁷ which estimates training needs to increase by 13% by 2028/2029 and more than 30% by 2031/32. New and creative methods of training will be needed to address this challenge to the Medical Physics workforce.

Background

The Medical Physics workforce is largely made up of clinical scientists and clinical technologists. This workforce helps to bridge the gap between the scientific understanding and the clinical environments within healthcare. Clinical scientists provide advice on the compliance with relevant regulations and guidance surrounding treatment and imaging using a range of radiation sources (e.g. x-ray, nuclear medicine, ultrasound, MRI, radiotherapy, etc.). Clinical technologists perform quality assurance tasks, maintain equipment and ensuring equipment safety. Some clinical technology roles, especially in Nuclear Medicine departments, provide patient care to those undergoing investigations in the department. Table 1 provides a breakdown of these roles and training requirements within the Medical Physics workforce.

Title	Job Roles	Training
Clinical Technologists or Healthcare Science Practitioners	Undertakes roles such as quality assurance on a range of medical equipment and supports with safe medical equipment management. Some roles may also be clinically focused, performing patient investigations. Roles can be advanced, managerial and/or research focused.	Normally a science degree graduate who has completed an approved clinical training scheme or shown equivalence. Apprenticeship options exist for those without a degree. This often involves committing to a programme such as the Practitioner Training Programme (PTP). There is a voluntary Clinical Technologist register.
Clinical Scientists or Medical Physicists or Healthcare Scientists	Support regulatory compliance with relevant legislation or guidance. Support with Research and Development within their scope of healthcare science. Often will also be qualified as a Radiation Protection Adviser, Medical Physics Expert, Magnetic Resonance Safety Expert or Radiation Waste Adviser.	A science graduate with a master's degree in medical physics, completes approved clinical training scheme e.g. Scientist Training Programme (STP) or 'Route 2' equivalence through IPEM. All Clinical Scientists are registered with the Health and Care Professions Council (HCPC).

Table 1: Healthcare practitioner and healthcare scientist NHS Employers role profiles.

Routes into Medical Physics

Currently, the main training route for Medical Physicists is the Scientist Training Programme⁸ (STP) delivered by the National School of Healthcare Science (NSHCS). NSHCS Accredited training centres indicate the number of trainees that they can accommodate to NHS England (NHSE). Approved posts are fully funded by NHSE. Training involves one year of training in all areas of Medical Physics and two years of focused training in one specialist area. Trainees that have completed the STP will have an MSc in Medical Physics and are eligible for HCPC Clinical Scientist registration.

An alternative route to HCPC Clinical Scientist registration is via the Academy for Healthcare Science Certificate of Equivalence scheme. These posts are often filled by candidates who hold qualification and / or professional experience equivalent to those undergoing the STP. Candidates may apply for a substantive vacancy at a trust, albeit lacking HCPC registration. Candidates may be taken on at a lower banding and apply for equivalence.

The final route to become a Clinical Scientist is the Association of Clinical Scientists “Route 2”⁹ certificate of Attainment. This route is becoming an increasingly popular choice into the career, as HCPC registered applicants can be difficult to attract. A major benefit of Route 2 training over the STP is the more focused approach. Unlike STP trainees, Route 2 trainees only train in one area of Medical Physics. This means they can become embedded into a department quicker than an STP trainee. Route 2 also has less prescriptive training requirements than STP. Route 2 trainees complete a portfolio of work which allows the evidence to better reflect the needs of the department. Often Route 2 candidates may already have a suitable MSc or PhD, this makes it possible to complete Route 2 in 2 years compared to the 3-year STP course. Route 2 is also better suited for more mature trainees or those with experience in industry and / or academia. The biggest barrier to Route 2 training is that there is no funding for these from NHSE unlike the funding for STP.

For Clinical Technologists, the Practitioner Training Programme¹⁰ (PTP) was established around the same time as the STP. However, due to limited numbers and difficulties with establishing education providers, this route is less commonly used within Medical Physics.

The more common route to become a Clinical Technologist is the IPEM Clinical Technologist Training Scheme¹¹ (TTS) in which a trainee undertakes at least 2 years of on-the-job training. Prior to completion, the trainee is expected to have achieved a level 6 (degree level) education. These posts are largely funded by the employing Trust, although the apprenticeship levy¹¹ may be used for the funding of any academic components of the training.

Survey Methodology

With the establishment of the West Midlands Imaging Network (WMIN), Special Interest Groups (SIG) have been founded. In collaboration with the Medical Physics and Workforce SIGs, a survey was performed with all the Medical Physics Departments in the West Midlands region. The invite to participate went out to all regional heads of department or their respective deputy.

The survey included questions on current staffing levels and vacancies for both clinical scientists as well as clinical technologists. Training capacity was also investigated looking at both current and projected capacity over the next 5 years. Finally, barriers to increasing training capacity were identified.

Each participant was provided with the survey and asked to respond before a one-to-one interview took place exploring some of the barriers further. The survey and the interviews were conducted between September 2023 and January 2024. The Medical Physics Departments affiliated with the following Trusts were invited to take part:

- The Royal Wolverhampton NHS Trust
- Sandwell and West Birmingham NHS Trust
- University Hospitals Birmingham NHS Foundation Trust
- University Hospitals Coventry and Warwickshire NHS Trust
- University Hospitals of North Midlands NHS Trust

Current Staffing Levels

At the time of data collection, there were a total of 57.3 whole time equivalent (WTE) Clinical Scientists working within Imaging Specialities of Medical Physics in the West Midlands region. A full breakdown of the data can be seen in Table 2 which details the various imaging specialities within Medical Physics.

The data for clinical technologists was more difficult to establish due to Nuclear Medicine Technologists falling outside of the management of the Medical Physics department. Nuclear medicine workforce is being addressed by the WMIN Nuclear Medicine SIG. Despite this, the number of clinical technologists managed by medical physics in the West Midlands total 77.5 WTE.

The current vacancy rates for both Clinical Scientists and Technologists is at around 10% of the current workforce. This finding matches the IPEM reports published for medical physics workforce current vacancy data.

Specialism	Current Staffing Levels (WTE)		Current Vacancies (WTE)	
	Clinical Technologists	Clinical Scientists	Clinical Technologists	Clinical Scientists
<i>Diagnostic Radiology and Radiation Protection (DR&RP)</i>	13.9	21.6	1.4 (10%)	0.0
<i>Nuclear Medicine (NM)</i>	62.8*	25.2	8.0* (13%)	4.0 (16%)
<i>Non-Ionising (MRI/US/Lasers/UV)</i>	0.8	10.5	0.0	1.0 (10%)
<i>Total</i>	<i>77.5</i>	<i>57.3</i>	<i>9.4 (12%)</i>	<i>5.0 (9%)</i>

*Staffing levels and vacancy rates for Nuclear Medicine Technologists only reflected by departments where these staff are managed by Medical Physics.

Table 2: Staffing data collected from Medical Physics Departments within the West Midlands Region.

Although the collected data reflects the current situation in medical physics, several IPEM workforce reports indicate that there is a large discrepancy between established levels and safe staffing levels. These safe staffing levels are based on recommendations made by IPEM working parties or European Federation of Medical Physics (EFOMP).

Barriers to Training

Based on the data collected and that published by IPEM, there is clearly a need to invest more in the Medical Physics workforce. To achieve this, however, requires an increase to the number of people being trained. Departments often find it difficult to commit to training new staff due to several barriers. As part of the WMIN survey, the barriers to training investigated and discussed these as part of the one-to-one interviews. The responses are summarised in Table 3.

Barrier to Training	Percentage of Trusts [%]
Funding	80
Staff resource	80
Physical space	60
Staff absences	20

Table 3: Barriers to training additional Medical Physics staff.

Funding

One of the largest barriers to training was the funding for the training posts as well as the funding for the support needed to provide training. Funding for the scientist training programme (STP) has been in place since its inception in 2012 and provides funding for one Band 6 position for three years. This funding is provided by NHS England and is managed nationally. Alternatively, other funding sources for training include the apprenticeship levy which may not always be appropriate. Medical Physics departments are encouraged to utilise all available funding.

Staff Resource

Similarly to funding, many Medical Physics departments were concerned about the added burden of additional training. This was a big concern for smaller departments where trainee to qualified staff ratio could reach 1:1. Using the WMIN and the Medical Physics SIG as a platform, there is interest in establishing a more collaborative approach to training across the region.

A regional practice educator role can help with establishing this collaboration. At the time of writing this report, the Midlands does not have this role for Medical Physics. The funding for this role exists but has not been utilised. The Midlands are therefore already falling behind in the development of robust regional training when compared to other regions across England.

Another discussion point was the establishment of regional training material and resources. Each Medical Physics department is currently expected to produce a training plan for their trainees. Standardising these training plans across the West Midlands would improve efficiency and avoid unnecessary repetition. As well as efficiency, shared practice would ensure that all trainees in the region are receiving the same level of quality training.

Physical Space

A concern for many departments was office desk space for any additional trainees. In some Trusts, office space has been repurposed for use as clinical areas. This results in less office space for dedicated trainee desks. However, since the COVID pandemic, there is more scope for staff and trainees to utilise remote working to address these concerns. Utilising office space more efficiently along with the use of hot-desking is also recommended.

Staff Absence

A concern raised by one Trust was that of staff absences and the impact this would have on training. Concerns were raised in relation to existing low levels of staffing and the potential for sickness or other unplanned long-term absences. To address this, the collaborative approach to training in the region would need to be developed further to provide the reassurance for departments with these concerns.

Recommendations

Based on the results from the survey and the discussions held with representatives from each of the Imaging Medical Physics departments, a new approach to training is needed. The following recommendations have been made to help support this change:

1. All departments to utilise available funding sources or training levies to increase their training capacity through all available routes into Medical Physics.
2. A Medical Physics practice educator role should be established.
3. All departments within the region commit to supporting trainees through providing opportunities for shared learning.
4. All department within the region commit to developing training resources and materials for shared learning.

Conclusions

With the increasing demand from expanding imaging services, the Medical Physics workforce needs to respond urgently. The WMIN provides a platform to support by improving the collaboration of departments on a regional basis. All the Trusts that took part in this workforce survey indicated a positive response to addressing the concerns surrounding workforce as a region. The biggest concern being that of training new staff in Medical Physics. It has been recommended that a new and robust approach to training is needed to help meet this demand.

References

1. Diagnostics: Recovery and Renewal Report (Richards' Report) (2020)
2. CDCs Unveiled: Challenges and Limitations - [RCR Website](#)
3. IPEM Workforce Report – Diagnostic Radiology and Radiation Protection (2021)
4. IPEM Workforce Report – MRI (2022)
5. IPEM Workforce Report – Nuclear Medicine (2021)
6. IPEM Official Statement on Medical Physics Workforce (2023)
7. NHS Long Term Workforce Plan (2023)
8. Information on STP - [National School of Healthcare Science Website](#)
9. What is Route 2? – [IPEM Website](#)
10. Information on PTP – [National School of Healthcare Science Website](#)
11. Information on TTS - [IPEM Website](#)
12. How are Apprenticeships funded? – [Education Hub Gov.UK Website](#)